

REMARKS

In view of the following remarks, the Examiner is respectfully requested to withdraw the rejections and allow Claims 1, and 3-19, the only claims pending and currently under examination in this application.

Claim Rejections – 35 USC § 103

1. Claims 1, 3-5, 12, 18 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Margherita (U.S. patent 4,111,656; the '656 patent) in view of Zarling et al. (U.S. patent 5,674,698; the '698 patent) and further in view of Kartel et al. (Chemosphere 1999; vol. 38, no. 11, pp. 2591 – 2596).

With regard to obviousness rejections, MPEP §2143 states the following:

To establish a prima facie case of obviousness, three basic criteria must be met. First, **there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.** Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).
(emphasis added)

With regard to establishing that there is some suggestion or motivation to modify the reference or to combine reference teachings, the MPEP goes on to state the following:

I. THE PRIOR ART MUST SUGGEST THE DESIRABILITY OF THE CLAIMED INVENTION

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

In *In re Fine*, the claims were directed to a system for detecting and measuring minute quantities on nitrogen compounds comprising a gas chromatograph, a

converter which converts nitrogen compounds into nitric oxide by combustion, and a nitric oxide detector. The primary reference disclosed a system for monitoring sulfur compounds comprising a chromatograph, combustion means, and a detector, and the secondary reference taught nitric oxide detectors. The examiner and Board asserted that it would have been within the skill of the art to substitute one type of detector for another in the system of the primary reference, however the court found there was no support or explanation of this conclusion and reversed.

In *In re Jones*, the claimed invention was the 2-(2- ϕ -aminoethoxy) ethanol salt of dicamba, a compound with herbicidal activity. The primary reference disclosed inter alia the substituted ammonium salts of dicamba as herbicides, however the reference did not specifically teach the claimed salt. Secondary references teaching the amine portion of the salt were directed to shampoo additives and a byproduct of the production of morpholine. The court found there was no suggestion to combine these references to arrive at the claimed invention.
(emphasis added)

The Applicants submit that both *In re Fine* and *In re Jones* are relevant to the rejections of the claims of the present application.

In both *In re Fine* and *In re Jones*, the court found that the mere fact that the substitution of one element for another can be made is not sufficient to meet the standard of providing a "suggestion or motivation" to combine the prior art references to defeat patentability of a claim. In other words, the court explicitly rejects the practice of establishing a "suggestion or motivation" to combine prior art teachings by simply asserting that the substitution could be made. Rather, the court's position is that there must be an affirmative suggestion or motivation to combine the reference teachings.

The Applicants submit that the Examiner, in failing to provide any citation in the cited prior, or any knowledge generally available to one of skill in the art, has not met this standard in asserting that Claim 1 (the only independent claim) is obvious over the cited references. Specifically, the Examiner has provided no suggestion or motivation for replacing the metal chelating agent in the '656 patent (i.e., EDTA) with the metal ion chelating polysaccharide of Kartel et al. Indeed, EDTA has substantial structural differences from the metal ion chelating polysaccharides of Kartel et al. as well as distinct metal ion binding characteristics (i.e., EDTA binds preferably to Zn^{2+} whereas the metal ion chelating polysaccharides of Kartel et al. bind poorly to Zn^{2+} , and instead

bind preferably to other metal ions, e.g., Pb²⁺). Given these facts, one of skill in the art would not be motivated to replace EDTA with the metal ion binding polysaccharides of Kartel et al. Without such a suggestion or motivation, a *prima facie* case of obviousness cannot be established by the cited prior art.

In addition to the requirements noted above in establishing a *prima facie* case of obviousness, MPEP §2141 states the following:

I. <TO RELY ON A REFERENCE UNDER 35 U.S.C. 103, IT MUST BE ANALOGOUS PRIOR ART

The examiner must determine what is "analogous prior art" for the purpose of analyzing the obviousness of the subject matter at issue. "In order to rely on a reference as a basis for rejection of an applicant's invention, **the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.**" In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also In re Deminski, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992) (*emphasis added*)

The Applicants submit that Kartel et al. is not analogous art to the field of Applicant's endeavor. Specifically, Kartel et al. is drawn to determining the applicability of certain manufactured pectins as food additives based on their metal binding properties. Kartel et al. is not drawn in any way to analyte detection assays as is claimed. As such, it is clear that Kartel et al. is drawn to non-analogous art to the Applicant's field of endeavor.

Furthermore, with regard to rebutting a *prima facie* case of obviousness, MPEP §716 states the following:

Evidence of unobvious or unexpected advantageous properties, such as superiority in a property the claimed compound shares with the prior art, can rebut *prima facie* obviousness. "Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness." No set number of examples of superiority is required. In re Chupp, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987) (*emphasis added*)

As such, in further support of the non-obviousness of the claimed invention, the Applicants provide herewith a Declaration under 37 C.F.R. §1.132 (revised from the previously filed Declaration) which establishes that practicing the invention as claimed provides unexpected results. Specifically, this Declaration includes data from experiments performed by an inventor of the claimed invention (Dr. Grigoriy Tchaga) which demonstrate an unexpected reduction in the background fluorescence in analyte binding assays that include metal ion chelating polysaccharides in the binding buffer (i.e., apple pectin) as compared to assays in which the binding buffer contains either: 1) another metal ion chelating agent (i.e., ascorbic acid, maleic acid, malonic acid, or succinic acid), or 2) no metal ion chelating agent. This unexpected reduction in background fluorescence leads to significant increases in the sensitivity of the claimed analyte detection assays.

The Applicants submit that the 37 CFR §1.132 Declaration submitted herewith demonstrates that metal ion chelating polysaccharides, when present in a solution, provide an unexpected reduction in the background fluorescence in array-based analyte detection assays as compared to those that include other metal ion chelating agents or none at all. The prior art of record fails to teach that any metal ion chelating agent, let alone the polysaccharide metal ion chelating agents claimed, reduce background fluorescence to such an extent.

Therefore, *even if* the Examiner continues to assert that the cited prior art provides a suggestion or motivation to combine their teachings, the Applicants submit that a *prima facie* case of obviousness still has not been established because the Declaration provided by Dr. Grigoriy Tchaga demonstrates unexpected results of practicing the invention as claimed.

In summary, the Applicants submit the following: 1) there is no suggestion or motivation found in any of the cited prior art, or in the general knowledge of one of skill in the art, to use the metal chelating polysaccharides of Kartel et al. in the biological

assays of the '656 patent; 2) Kartel et al. is drawn to non-analogous art; and 3) practicing the invention as claimed leads to unexpected results (as shown in the 37 C.F.R. §1.132 Declaration of Dr. Tchaga).

In view of this, the Applicants submit that a *prima facie* case of obviousness has not been established and therefore respectfully request withdrawal of this rejection.

2. Claims 6-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Margherita (U.S. patent 4,111,656; the '656 patent) in view of Zarling et al. (U.S. patent 5,674,698; the '698 patent) and further in view of Kartel et al. (Chemosphere 1999; vol. 38, no. 11, pp. 2591 – 2596), Schoemaker et al. (U.S. patent 4,837,167; the '167 patent) and Pronovost et al. (U.S. patent 5,773,234; the '234 patent).

In this rejection, the Examiner is again relying on the teachings of the '656 patent, the '698 patent and Kartel et al. to establish a *prima facie* case of obviousness.

However, as discussed above, the Applicants submit that the Examiner's *prima facie* case of obviousness is deficient because: 1) there is no suggestion or motivation found in any of the cited prior art, or in the general knowledge of one of skill in the art, to use the metal chelating polysaccharides of Kartel et al. in the biological assays of the '656 patent; 2) Kartel et al. is drawn to non-analogous art; and 3) practicing the invention as claimed leads to unexpected results (as shown in the 37 C.F.R. §1.132 Declaration of Dr. Tchaga).

In view of these deficiencies, the Applicants respectfully request withdrawal of this rejection.

3. Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Margherita (U.S. patent 4,111,656; the '656 patent) in view of Zarling et al. (U.S. patent 5,674,698; the '698 patent) and further in view of Kartel et al. (Chemosphere 1999; vol.

38, no. 11, pp. 2591 – 2596) and Wohlstadter et al. (U.S. patent 6,207,369; the '369 patent).

In this rejection, the Examiner is again relying on the teachings of the '656 patent, the '698 patent and Kartel et al. to establish a *prima facie* case of obviousness.

However, as discussed above, the Applicants submit that the Examiner's *prima facie* case of obviousness is deficient because: 1) there is no suggestion or motivation found in any of the cited prior art, or in the general knowledge of one of skill in the art, to use the metal chelating polysaccharides of Kartel et al. in the biological assays of the '656 patent; 2) Kartel et al. is drawn to non-analogous art; and 3) practicing the invention as claimed leads to unexpected results (as shown in the 37 C.F.R. §1.132 Declaration of Dr. Tchaga).

In view of these deficiencies, the Applicants respectfully request withdrawal of this rejection.

4. Claims 13 – 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Margherita (U.S. patent 4,111,656; the '656 patent) in view of Zarling et al. (U.S. patent 5,674,698; the '698 patent) and further in view of Kartel et al. (Chemosphere 1999; vol. 38, no. 11, pp. 2591 – 2596), Schoemaker et al. (U.S. patent 4,837,167; the '167 patent), Pronovost et al. (U.S. patent 5,773,234; the '234 patent) and Wohlstadter et al. (U.S. patent 6,207,369; the '369 patent).

In this rejection, the Examiner is again relying on the teachings of the '656 patent, the '698 patent and Kartel et al. to establish a *prima facie* case of obviousness.

However, as discussed above, the Applicants submit that the Examiner's *prima facie* case of obviousness is deficient because: 1) there is no suggestion or motivation found in any of the cited prior art, or in the general knowledge of one of skill in the art, to

use the metal chelating polysaccharides of Kartel et al. in the biological assays of the '656 patent; 2) Kartel et al. is drawn to non-analogous art; and 3) practicing the invention as claimed leads to unexpected results (as shown in the 37 C.F.R. §1.132 Declaration of Dr. Tchaga).

In view of these deficiencies, the Applicants respectfully request withdrawal of this rejection.

5. Claims 1, 3-5, 10 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Velandar et al. (U.S. patent 5,328,603; the '603 patent) in view of Zarling et al. (U.S. patent 5,674,698; the '698 patent) and further in view of Kartel et al. (Chemosphere 1999; vol. 38, no. 11, pp. 2591 – 2596).

In this rejection, the Examiner has replaced the teachings of the '656 patent with those of the '603 patent. Specifically, the Examiner asserts that the use of EDTA in the buffers of the '603 patent coupled with the disclosure of metal ion chelating polysaccharides by Kartel et al. establish a *prima facie* case of obviousness for Claim 1.

However, merely citing another reference that teaches a buffer composition containing EDTA, without addressing the deficiencies in providing a suggestion or motivation and a reasonable expectation of success, fails to remedy the deficiencies in the Examiner's *prima facie* case of obviousness. Therefore, similar to the previous rejections, the Examiner's present *prima facie* case of obviousness is deficient because: 1) there is no suggestion or motivation found in any of the cited prior art, or in the general knowledge of one of skill in the art, to use the metal chelating polysaccharides of Kartel et al. in the biological assays of the '603 patent; 2) Kartel et al. is drawn to non-analogous art; and 3) practicing the invention as claimed leads to unexpected results (as shown in the 37 C.F.R. §1.132 Declaration of Dr. Tchaga).

In view of these deficiencies, the Applicants respectfully request withdrawal of this rejection.

6. Claims 13 – 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Velandar et al. (U.S. patent 5,328,603; the '603 patent) in view of Zarling et al. (U.S. patent 5,674,698; the '698 patent) and further in view of Kartel et al. (Chemosphere 1999; vol. 38, no. 11, pp. 2591 – 2596), Schoemaker et al. (U.S. patent 4,837,167; the '167 patent), Pronovost et al. (U.S. patent 5,773,234; the '234 patent) and Wohlstadter et al. (U.S. patent 6,207,369; the '369 patent).

In this rejection, the Examiner is again relying on the teachings of the '603 patent and Kartel et al. to establish a *prima facie* case of obviousness.

However, as discussed above, the Applicants submit that the Examiner's *prima facie* case of obviousness is deficient because: 1) there is no suggestion or motivation found in any of the cited prior art, or in the general knowledge of one of skill in the art, to use the metal chelating polysaccharides of Kartel et al. in the biological assays of the '603 patent; 2) Kartel et al. is drawn to non-analogous art; and 3) practicing the invention as claimed leads to unexpected results (as shown in the 37 C.F.R. §1.132 Declaration of Dr. Tchaga).

In view of these deficiencies, the Applicants respectfully request withdrawal of this rejection.

CONCLUSION

In view of the remarks above, this application is considered to be in good and proper form for allowance and the Examiner is respectfully requested to pass this application to issuance.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-0815, order number CLON-060.

Respectfully submitted,

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